

Please amend the application as follows:

In the Claims

Please ~~cancel~~ Claim 19.

Please ~~amend~~ Claims 1, 5-8, 11, 12, 27, 32, 53 and 54. Amendments to the claims are indicated in the attached "Marked Up Version of Amendments" (pages i – iv).

*SUB B17*  
*a1*  
1. (Amended) A method for evaluating a plurality of candidate index sets for a workload of database statements in a database system, the method comprising:

forming an index superset from a union of a current index set and a proposed index set;

deriving a candidate index set from the index superset, the derived candidate index set being included in the plurality of candidate index sets;

generating statistics based on the derived candidate index set; and

presenting the generated statistics.

5. (Amended) The method of Claim 56, wherein deriving the baseline statistics comprises disabling current indexes.

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6. (Amended) The method of Claim 1, wherein generating statistics for a statement comprises generating at least one statistic based on an execution plan created by an optimizer.

7. (Amended) The method of Claim 6, wherein the execution plan is based on available access paths.

8. (Amended) The method of Claim 6, wherein the execution plan is based on statistics for at least one schema object accessed by the statement.

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11. (Amended) The method of Claim 6, further comprising:

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cont

for a table accessed by a statement under evaluation, using the execution plan to identify at least one index that would be used to retrieve data from the table upon an execution of the statement.

12. (Amended) The method of Claim 6, wherein the optimizer generates a cost of the execution plan.

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27. (Amended) A system for evaluating a plurality of candidate index sets for a workload in a database system, the workload derived from a plurality of statements, the system comprising:

a workload evaluator which evaluates each statement within the workload;  
an index solution evaluator which, responsive to the workload evaluator, evaluates each index in a candidate index set with respect to the workload, the candidate index solution being one of the plurality of candidate index sets, each candidate index set derived from an index superset formed by the union of a current index set and a proposed index set;  
a solution/rollup evaluator which, responsive to the index solution evaluator, evaluates the candidate index solution; and  
a solution refiner which, responsive to the solution/rollup evaluator, generates at least one new candidate index solution.

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32. (Amended) The system of Claim 27, wherein the workload evaluator evaluates an execution plan created by an optimizer, the execution plan comprising, for each statement of the workload, an execution plan which represents a series of steps for executing the statement, the workload evaluator further generating and recording statistics based on the evaluation of the execution plan.

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53. (Amended) A computer program product for evaluating a plurality of candidate index sets for a workload of database statements in a database system, the computer program product comprising a computer usable medium having computer readable code thereon, including program code which:

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forms an index superset from a union of a current index set and a proposed index set;

repeatedly

derives a candidate index set from the index superset, the derived candidate index set being included in the plurality of candidate index sets, and

generates statistics based on the derived candidate index set; and presents the generated statistics.

54. (Amended) A computer data signal embodied in a carrier wave for evaluating a plurality of candidate index sets for a workload of database statements in a database system, comprising:

program code for forming an index superset from a union of a current index set and a proposed index set;

program code for repeatedly

deriving a candidate index set from the index superset, the derived candidate index set being included in the plurality of candidate index sets, and

generating statistics based on the derived candidate index set;

and

program code for presenting the generated statistics.

[Please add new Claims 55-136.]

55. (New) The method of Claim 1, wherein the statistics include index volatility.
56. (New) The method of Claim 1, further comprising:  
generating baseline statistics for each statement in the workload, wherein generating statistics is additionally based on the baseline statistics.
57. (New) The system of Claim 32, wherein the statistics include index volatility.

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58. (New) The computer program product of Claim 53, further comprising code which:  
generates current index statistics for the workload responsive to the current  
index set, the presented generated statistics comprising the generated current index  
statistics.
59. (New) The computer program product of Claim 53, further comprising code which:  
repeatedly derives a candidate index set and generates statistics based on the  
proposed index set.
60. (New) The computer program product of Claim 59, further comprising code which:  
terminates the repeated execution when at least one candidate index solution is  
found that adheres to user-imposed constraints and no further indexes can be removed  
from said candidate index solution without degrading performance of the workload and  
without disabling an integrity constraint.
61. (New) The computer program product of Claim 53, wherein the statistics include index  
volatility.
62. (New) The computer program product of Claim 53, further comprising code which:  
generates baseline statistics for each statement in the workload, wherein  
generating statistics is additionally based on the baseline statistics.
63. (New) The computer program product of Claim 62, wherein deriving the baseline  
statistics comprises disabling current indexes.
64. (New) The computer program product of Claim 53, wherein statistics for a statement  
are generated by generating at least one statistic based on an execution plan created by  
an optimizer.

65. (New) The computer program product of Claim 64, wherein the execution plan is based on available access paths.
66. (New) The computer program product of Claim 64, wherein the execution plan is based on statistics for at least one schema object accessed by the statement.
67. (New) The computer program product of Claim 66 wherein the at least one schema object is a table.
68. (New) The computer program product of Claim 66 wherein the at least one schema object is an index.
69. (New) The computer program product of Claim 64, further comprising code which:  
for a table accessed by a statement under evaluation, uses the execution plan to identify at least one index that would be used to retrieve data from the table upon an execution of the statement.
70. (New) The computer program product of Claim 64, wherein the optimizer generates a cost of the execution plan.
71. (New) The computer program product of Claim 70, wherein the cost of the execution plan is derived from a resource use needed to execute the statement according to the execution plan.
72. (New) The computer program product of Claim 71, wherein the resource use includes CPU execution time.
73. (New) The computer program product of Claim 71, wherein the resource use includes input/output access.

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74. (New) The computer program product of Claim 64, wherein the statistics include the number of executions of the statement.
75. (New) The computer program product of Claim 64, wherein the statistics include a user-defined importance of the statement.
76. (New) The computer program product of Claim 64, wherein the statistics include an index usage.
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an4 77. (New) The computer program product of Claim 53, wherein the statements are SQL statements.
78. (New) The computer program product of Claim 53, wherein the workload is reduced into unique statements.
79. (New) The computer program product of Claim 53, wherein a candidate index set is derived responsive to a predetermined maximum number of allowed indexes.
80. (New) The computer program product of Claim 53, wherein deriving a candidate index set is responsive to available storage space.
81. (New) The computer program product of Claim 53, wherein the proposed index set is provided by a user.
82. (New) The computer program product of Claim 53, wherein the proposed index set is provided by an expert system.
83. (New) The computer program product of Claim 53, wherein an execution plan is created without creating indexes which are not in the current index set.
84. (New) The computer data signal of Claim 54, further comprising:

program code for generating current index statistics for the workload responsive to the current index set, the presented generated statistics comprising the generated current index statistics.

85. (New) The computer data signal of Claim 54, further comprising:  
program code for repeatedly deriving a candidate index set and generating statistics based on the proposed index set.
86. (New) The computer data signal of Claim 85, further comprising:  
program code for terminating the repeated execution when at least one candidate index solution is found that adheres to user-imposed constraints and no further indexes can be removed from said candidate index solution without degrading performance of the workload and without disabling an integrity constraint.
87. (New) The computer data signal of Claim 54, wherein the statistics include index volatility.
88. (New) The computer data signal of Claim 54, further comprising:  
program code for generating baseline statistics for each statement in the workload, wherein statistics are generated based additionally on the baseline statistics.
89. (New) The computer data signal of Claim 88, wherein deriving the baseline statistics comprises disabling current indexes.
90. (New) The computer data signal of Claim 54, wherein generating statistics for a statement comprises generating at least one statistic based on an execution plan created by an optimizer.
91. (New) The computer data signal of Claim 90, wherein the execution plan is based on available access paths.

92. (New) The computer data signal of Claim 90, wherein the execution plan is based on statistics for at least one schema object accessed by the statement.
93. (New) The computer data signal of Claim 92 wherein the at least one schema object is a table.
94. (New) The computer data signal of Claim 92 wherein the at least one schema object is an index.
95. (New) The computer data signal of Claim 90, further comprising:  
program code for using, for a table accessed by a statement under evaluation, the execution plan to identify at least one index that would be used to retrieve data from the table upon an execution of the statement.
96. (New) The computer data signal of Claim 90, wherein the optimizer generates a cost of the execution plan.
97. (New) The computer data signal of Claim 96, wherein the cost of the execution plan is derived from a resource use needed to execute the statement according to the execution plan.
98. (New) The computer data signal of Claim 97, wherein the resource use includes CPU execution time.
99. (New) The computer data signal of Claim 97, wherein the resource use includes input/output access.
100. (New) The computer data signal of Claim 90, wherein the statistics include the number of executions of the statement.



101. (New) The computer data signal of Claim 90, wherein the statistics include a user-defined importance of the statement.
102. (New) The computer data signal of Claim 90, wherein the statistics include an index usage.
103. (New) The computer data signal of Claim 54, wherein the statements are SQL statements.
104. (New) The computer data signal of Claim 54, wherein the workload is reduced into unique statements.
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adn 105. (New) The computer data signal of Claim 54, wherein deriving a candidate index set is responsive to a predetermined maximum number of allowed indexes.
106. (New) The computer data signal of Claim 54, wherein deriving a candidate index set is responsive to available storage space.
107. (New) The computer data signal of Claim 54, wherein the proposed index set is provided by a user.
108. (New) The computer data signal of Claim 54, wherein the proposed index set is provided by an expert system.
109. (New) The computer data signal of Claim 54, wherein an execution plan is created without creating indexes which are not in the current index set.
110. (New) A system for evaluating a plurality of candidate index sets for a workload of database statements in a database system, comprising:  
 means for forming an index superset from a union of a current index set and a proposed index set;

means for deriving a candidate index set from the index superset, the derived candidate index set being included in the plurality of candidate index sets;  
means for generating statistics based on the derived candidate index set; and  
means for presenting the generated statistics.

111. (New) The system of Claim 110, further comprising:

means for generating current index statistics for the workload responsive to the current index set, the presented generated statistics comprising the generated current index statistics.

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112. (New) The system of Claim 110, further comprising:

means for repeatedly deriving a candidate index set and generating statistics based on the proposed index set.

113. (New) The system of Claim 112, further comprising:

means for terminating the repeated execution when at least one candidate index solution is found that adheres to user-imposed constraints and no further indexes can be removed from said candidate index solution without degrading performance of the workload and without disabling an integrity constraint.

114. (New) The system of Claim 110, wherein the statistics include index volatility.

115. (New) The system of Claim 110, further comprising:

means for generating baseline statistics for each statement in the workload, wherein statistics are generated based additionally on the baseline statistics.

116. (New) The system of Claim 115, wherein deriving the baseline statistics comprises disabling current indexes.

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- 117. (New) The system of Claim 110, wherein generating statistics for a statement comprises generating at least one statistic based on an execution plan created by an optimizer.
  - 118. (New) The system of Claim 117, wherein the execution plan is based on available access paths.
  - 119. (New) The system of Claim 117, wherein the execution plan is based on statistics for at least one schema object accessed by the statement.
  - 120. (New) The system of Claim 119 wherein the at least one schema object is a table.
  - 121. (New) The system of Claim 119 wherein the at least one schema object is an index.
  - 122. (New) The system of Claim 117, further comprising:  
means for using, for a table accessed by a statement under evaluation, the execution plan to identify at least one index that would be used to retrieve data from the table upon an execution of the statement.
  - 123. (New) The system of Claim 117, wherein the optimizer generates a cost of the execution plan.
  - 124. (New) The system of Claim 123, wherein the cost of the execution plan is derived from a resource use needed to execute the statement according to the execution plan.
  - 125. (New) The system of Claim 124, wherein the resource use includes CPU execution time.
  - 126. (New) The system of Claim 124, wherein the resource use includes input/output access.

127. (New) The system of Claim 117, wherein the statistics include the number of executions of the statement.
128. (New) The system of Claim 117, wherein the statistics include a user-defined importance of the statement.
129. (New) The system of Claim 117, wherein the statistics include an index usage.
130. (New) The system of Claim 110, wherein the statements are SQL statements.
131. (New) The system of Claim 110, wherein the workload is reduced into unique statements.
132. (New) The system of Claim 110, wherein deriving a candidate index set is responsive to a predetermined maximum number of allowed indexes.
133. (New) The system of Claim 110, wherein deriving a candidate index set is responsive to available storage space.
134. (New) The system of Claim 110, wherein the proposed index set is provided by a user.
135. (New) The system of Claim 110, wherein the proposed index set is provided by an expert system.
136. (New) The system of Claim 110, wherein an execution plan is created without creating indexes which are not in the current index set.